

絶対重力測定と GNSS 観測による南極氷床変動と GIA の研究 -宗谷海岸およびセール・ロンダーネ山地-

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Study on the ice sheet changes and GIA by absolute gravity measurements and GNSS observations in Soya Coast and Sør Rondane Mts., Antarctica

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The solid Earth's responses to the ice mass change after the last glacial maximum are associated with viscoelastic deformations of the crust and mantle. These responses called as glacial isostatic adjustment (GIA) are essential observables for estimating viscosity in the deep mantle. The GIA is revealed as crustal deformations with the several thousand years timescale on the Earth's surface. The combination of repeated gravity measurement and GNSS observation over a few decades can observe the GIA. Since there are insufficient GIA observations in East Antarctica, it is difficult to reveal striking differences among GIA models. Such differences can cause uncertainty about estimations of recent Antarctic ice sheet mass change derived from various satellite data such as the satellite gravity mission, altimeter, and so on. Therefore, we advance the research project to observe the GIA by the combination of absolute gravity measurement and GNSS observation in East Antarctica, especially in Soya Coast and Sør Rondane Mts., where there is little GIA observation except for Syowa Station.

At Syowa Station, the repeated absolute gravity measurements and continuous GNSS observations have been carried out since 1995 (see also Hayakawa et al. in this symposium). This is only evidence that exhibits the temporal variations in both gravity and GNSS measurements due to the GIA. During phase VIII of the six-year Japanese Antarctic Research Project, we succeeded the absolute gravity measurement at Langhovde during 2011/2012 austral summer, which was the first outdoor measurement in the Japan Antarctic Research Expedition activity (Kazama et al. 2013). Subsequently, we performed the outdoor absolute gravity measurement at Selungen, the central parts of the Sør Rondane Mts., during 2013 austral summer. It is necessary to observe the absolute gravity and GNSS at these sites every 5 year. During phase IX, we plan to perform re-measurements and new combination measurements in Soya Coast and Sør Rondane Mts. and to improve (or validate) GIA model.

References

Kazama et al., Gravity measurements with a portable absolute gravimeter A10 in Syowa Station and Langhovde, East Antarctica, *Polar Sci.*, 7, 260-277, 2013.